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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/842,000	04/26/2001	Toru Otsubo	503.39737X00	7052

20457 7590 12/20/2002

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EXAMINER	
CROWELL, ANNA M	

ART UNIT	PAPER NUMBER
1763	7

DATE MAILED: 12/20/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/842,000	Applicant(s) OTSUBO, TORU	
	Examiner Michelle Crowell	Art Unit 1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 April 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,7 and 8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7 and 8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1a. The substitute specification filed November 29, 2001 has not been entered because it does not conform to 37 CFR 1.125(b)because: a marked up version is not provided (1), and a complete specification (non-marked up version) is not provided.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 2, 3, 7, and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 2, 7, and 8 recite the limitation, "a means to process plasma using the generated plasma" which is indefinite. The specification fails to specifically describe this means. Where is this limitation described in the specification?

4. Claim 3 recites the limitation, "said memory means" in lines 5 and 6. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 7 recites the limitation, "a RF bias circuit to send RF current to the substrate to be processed is suspended with respect to the ground" which is indefinite. How is the RF bias circuit suspended with respect to the ground? What does "suspended with respect to the ground" mean? Where is this limitation described in the specification?

6. Claim 8 recites the limitation, "means to control a RF current ratio" which is indefinite. The specification fails to specifically describe this means. How does this means control RF current ration? Where is this limitation described in the specification?

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claims 1, 2, 7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsubo et al. (Japanese Patent Publication 11-260596) in view of Yamagata et al. (U.S. 5,362,358).

Referring to Drawing 1 and 16, and paragraphs [0113]-[0130], Otsubo discloses a plasma processing apparatus comprising an etching gas supply mechanism, an exhaust air mechanism [0114], a counterelectrodes 71a 71b 71c (capacitively coupled discharge means, plasma generating means, multiple RF current conducting means) [115], a coil 58 (magnetic field forming means) [0131], a signal generator 97, a capacitor 83, and a stage electrode 52. Each of the counterelectrodes 71a 71b 71c is mutually insulated by insulating materials 80a 80b 80c, thereby creating mutually isolated multiple conductors [0115]. Furthermore, the counterelectrodes 71a 71b 71c are grounded through low pass filters (not shown), and a high-frequency current from a bias power supply 56 is allowed to flow through each of the

counterelectrodes 71a 71b 71c [0116]. Also, the bias power supply 56 (RF bias circuit) is supplied to the stage electrode 52 which sends a RF current to the substrate 55 [122]-[123].

A high-frequency voltage 81 and 82, whose phase can be shifted by a capacitor 83 (frequency displacement current control means), is supplied to the counterelectrodes 71, thereby generating electromagnetic waves. The power of electromagnetic waves radiates through the insulators and counterelectrodes (radio frequency displacement). A resonant circuit is formed via the insulators 80 and the capacitor 83. The signal generator 97 (electromagnetic wave power control means) controls the phase of the high-frequency signal [0130]. Alternately, the electromagnetic waves can be generated by antenna 11 [0041].

Specifically, the distribution of the plasma density can be controlled by controlling the radiated electromagnetic waves based on the adjustment of the phase of the high-frequency voltage supplied to the counterelectrodes 71. Moreover, the distribution of the plasma density due to capacitive coupled plasma can be controlled by controlling the outputs of the high frequency power supplies 81 and 82 (electromagnetic waver power control means) [0131].

Otsubo fails to specifically teach an electromagnetic wave power control means.

Referring to Figure 6 and column 5, lines 30-65, Yamagata teaches a motor speed controller (electromagnetic wave power control means) connected to variable capacitors 24 and 26 via a motor 80 (drive motor). A radio frequency (RF) power source 20 is provided between an impedance match network 22 and the ground. Selective application of RF power to the electrodes 12 and 14 is performed by controlling the capacitors 24 and 26. By controlling the variable capacitors 24 and 26, anisotropic or isotropic etching may be performed. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the

capacitor of Otsubo with the motor and controller as taught by Yamagata. By controlling the variable capacitors 24 and 26, anisotropic or isotropic etching may be selectively performed.

9. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otsubo et al. (Japanese Patent Publication 11-260596) in view of Yamagata et al. (U.S. 5,362,358) as applied to claims 1, 2, 7, and 8 above, and further in view of Misonoo et al. (Japanese Patent Publication 08-167588).

Otsubo fails to teach a means to store.

Referring to Drawing 1 and the abstract, Otsubo teaches a plasma treatment device comprising a plasma monitoring means 2, a comparison means 19, a memory means 18 and a current control means 16. The memory means 18 stores a plasma density distribution for a process. Plasma density distribution is controlled by the comparison means 17 and the current control means 16, thus uniformly treating the surface of a specimen with plasma. Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to provide the chamber of Otsubo with the memory means of Misonoo. This would store the information needed to plasma treat a substrate uniformly.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michelle Crowell whose telephone number is (703) 305-1956. The examiner can normally be reached on M-F (8:00 - 4:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (703) 308-1633. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

AMC
December 16, 2002